

ASPIDIUM MAINGAYI (Baker) Holttum, comb. nov.

There is a terrestrial *Aspidium* which is not uncommon in the natural forest remaining on Singapore Island, which has received at different times four specific names. It has also been confused with *Aspidium vastum* Bl., on account of its winged rachis (Beddome, Handbook, Suppl. p. 85). The synonymy is as follows:—

Polypodium heterosorum Baker, Syn. Fil. 2nd. Ed.
p. 506 (1874)

Gymnogramme Maingayi Baker, Syn. Fil. 2nd Ed.
p. 517 (1874)

Dictyopteris heterosora Beddome, F.B.I. Suppl. 20
(1876)

Selliguea Maingayi Bedd. F.B.I. Suppl. 24 (1876)

Phegopteris subdecurrens Luerrs, Bot. Centralbl. 11,
30 (1882)

Aspidium subdecurrens C.Chr., Ind. Fil. p. 94 (1905)

Polypodium Maingayi Diels, Nat. Pfl. 1, 4, p. 318 (1899)

Hemionitis Maingayi Ridley, Journ. Malayan Branch
R. Asiatic Soc. p. 106 (1926)

Campylogramme Trollii Goebel, Flora, N.F. 25, p. 282
(1931).

The name *heterosorum* in the genus *Aspidium* is already occupied by a species on p. 504 of the Synopsis Filicum; the next name in order of priority is therefore *Maingayi*. I have seen at Kew the type specimens concerned of Baker and Ridley; at Singapore are specimens which are declared by Dr. Carl Christensen to be identical with the type of *Phegopteris subdecurrens* (see this Bulletin vol. IV p. 393). From the photographs of *Campylogramme Trollii* I have no doubt that it also is to be referred to the same species.

Aspidium Bryanti Copeland from the Philippines is evidently closely allied.

Aspidium Maingayi is a terrestrial fern of shady forests, like most other malayan species of the genus. The lobes of fertile fronds are distinctly narrower than those of sterile fronds, and the fertile fronds usually stand erect in the centre of the plant, as in most terrestrial forest ferns. The production of fertile fronds is apparently a seasonal phenomenon, dependent on dry weather. The species is very variable, some forms being similar in habit to *Aspidium vastum* Bl. In the Malay Peninsula *A. vastum* does not appear to be common, whereas in the south at least and in some parts of Pahang *A. Maingayi* is locally abundant. Gœbel's *Campylogramme Trollii* was found on Pulau

Berhala, off the east coast of Sumatra; the lowland fern floras of Sumatra and the Peninsula are very similar. I have specimens of *A. Maingayi* from as far north as Penang, and eastwards from the Anamba Islands.

As regards form of the leaves, *A. Maingayi* is very variable, even among plants growing near together, and among fronds growing on the same plant. In the Singapore Botanic Gardens Jungle and the neighbouring aroid rockery are a number of plants growing spontaneously. Where a plant develops in a rather exposed position it grows only to a small size, with leaves having at most two pairs of lateral lobes, and will at this size produce fertile fronds. In more favourable shady places and in good soil the plants grow very large, the fronds with their stipes exceeding 1.20 metre in length, and bearing 5 or 6 pairs of lateral lobes or pinnæ, the lowest one or two of these being lobed again on the lower side and sometimes also on the upper side. The uppermost pair of lobes are always confluent with the apex of the frond, and their lamina is decurrent on the rachis, forming a wing. The extent of this wing is very variable. In the Singapore Gardens may be found fronds with the wing extending to the second pair of lateral lobes (or pinnæ) to the third, fourth or even fifth pair; and on some fronds (especially sterile fronds) the wing may extend half way or more down the stipe. The tendency in the gardens plants appears to be for later (and usually therefore larger) fronds to have a shorter wing than earlier fronds on the same plant; but some plants have more tendency than others to the shortening of the wing. On one small plant I found an earlier frond (fig 8, p. 231) with a wing nearly to the base of the stipe and a later frond (fig 7, p. 231) with the wing only just below the lowest pinnæ. At Bukit Timah, Singapore, are more plants, and among a group of these I could find none with a wing extending more than a few centimetres below the lowest pinnæ. Gœbel's illustration shows two fronds, one sterile (apparently the earlier one) with a wing nearly to the base, and a second fertile one with a wing not extending so far down the stipe. Gœbel's plant also, probably owing to pot culture and a rather strong light (compared with the light found in shady forest), has produced a fertile frond prematurely. From Gunong Tampin, and elsewhere in the neighbourhood of Malacca are specimens of fertile fronds with 3 or 4 pairs of lobes and a wing almost to the base of the stipe. There are also similar specimens from Klang Gates in Selangor, one from Temerloh, Pahang, and one collected by Bishop Hose at Penang. I have lately seen a large number of plants in Pahang, all with the wing extending down the greater part of the stipe.

On the other hand, a specimen from Perak (Kunstler 2289) has a rachis for the most part unwinged. Baker's *Gymnogramme Maingayi*, was based on specimens collected by Maingay and Pinwill, with rachis winged only towards the apex. His *Polypodium heterosorum* was based on a specimen of Griffith's, from Malacca, with the rachis and stipe broadly winged; as Beddome pointed out, this type is very like *Aspidium vastum* Bl., and in his Supplement (p. 85) Beddome definitely unites the two. In fact, there is little to distinguish the two vegetatively; *A. vastum* has a broader wing and usually narrower segments with more parallel sides. Both have similar long narrow scales on the stipes. The one definite distinction is in the sori. The sori of *A. vastum* are always round and indusiate. The sori of *A. Maingayi* are not indusiate and tend to spread along the veins. Göebel's photograph (p. 285) shows this admirably. In different specimens there is variation as to the extent of the spreading. In nearly all there is a tendency to spread in lines close to and parallel with the lateral veins of the pinnæ, and in some this is very marked. There is also a tendency to produce lines close to and parallel with the midribs of the pinnæ. The intermediate sori unite in various directions.

The other local non-indusiate species of *Aspidium*, *A. Barberi* (Hk.) C.Chr. and *A. irregulare* (Pr.) C.Chr., also show in most cases some spreading of their sori along the small veins, though not to the same extent as in *A. Maingayi*. It is clear however that apart from the soral question *A. Maingayi* is much more nearly related to *A. vastum* than to either of the non-indusiate species mentioned, or to many indusiate species of the genus. I consider therefore that *A. Maingayi* should be retained within the genus *Aspidium*.

The spreading of the sori along the veins in these non-indusiate species of *Aspidium* is comparable with the spreading and confluence of the sori which is occasional in *Dryopteris urophylla* (Wall) C.Chr. (in which I have never been able to detect an indusium) and frequent in the allied species, formerly referred to *Meniscium*, *D. cuspidata* (Bl.) Chr., *D. salicifolia* (Wall.) C.Chr., etc.

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Figs. 1—5, fertile fronds: 1—3, from Botanic Gardens, Singapore; 4, from Klang Gates, Selangor; 5, from Penang. The stipes of Nos. 1—3 are cut short.

Figs. 6—9, sterile fronds: all from Botanic Gardens, Singapore. The stipe of No. 6 only is cut short.

All figures $\frac{1}{2}$ natural size.



